Smart Ethernet Switch Series

User's Manual

Table of Contents

Table of Contents **1**

List of Figures **3**

List of Tables **5**

Preface **6**

Chapter 1. Introduction **7**

1.1. Overview *7*

1.2. Main Features *7*

1.3. Applications *7*

Chapter 2. Hardware Installation and Connection **9**

2.1. Package Content *9*

2.2. Safety Warnings *9*

2.3. Hardware Installation *9*
2.3.1. Desktop Mounting 9
2.3.2. Rack Mounting 9

2.4. Hardware Connection *9*
2.4.1. Ethernet Port Connections 11
2.4.2. Power Connection 12

2.5. LED Description *12*

Chapter 3. The Remote Management Tool **13**

3.1. Overview *13*

3.2. Installation Requirement *13*

3.3. Installing the RMT *13*

3.4. Accessing the RMT *17*

3.5. RMT Menu Summary *19*

3.6. Exiting the RMT and Saving Configuration *19*

Chapter 4. Network **21**

4.1. Switch Selection *21*
4.1.1. Adding a Switch to the Database 22

4.2. Switch Database *23*
4.2.1. Adding a Switch 24
4.2.2. Editing Switch Information 24
4.2.3. Deleting a Switch 24

Chapter 5. Switch Status **25**

5.1. Port Status *25*

5.2. MIB Information *26*
5.2.1. Changing the Counter Unit 27

5.3. Cable Tester 27
5.4. Signal Quality 28

Chapter 6. Switch Configuration 31

6.1. Global Configuration 31
6.2. Port Configuration 32
6.2.1. Trunk Group Setting 33
6.2.2. VLAN and Trunking 33
6.3. Quality of Service (QoS) Configuration 34
6.4. Introduction to VLAN 35
6.4.1. Port-Based VLAN 36
6.4.2. 802.1q Tagged VLAN 36
6.5. VLAN Configuration 36
6.5.1. Changing the VLAN Mode 38
6.5.2. Port-Based VLAN Configuration 38
6.5.3. 802.1q Tagged VLAN 41
6.6. Port Mirror Configuration 44
6.6.1. Port Mirror and Performance 45
6.6.2. Example: Port Mirror 46
6.7. Security Configuration 46

Chapter 7. Switch Internals 48

7.1. Device Management 48
7.1.1. Restoring the Configuration Back to the Factory Default 48
7.1.2. Saving Configuration 48
7.1.3. Restarting the Switch 49

Appendix 1. Troubleshooting 50

List of Figures

Figure 2-1 16 ports TX smart switch 10
Figure 2-2 16 ports TX with 1 port FX smart switch 10
Figure 2-3 24 ports TX smart switch 10
Figure 2-4 24 ports TX with 2 port FX smart switch 10
Figure 2-5 Connecting the Fiber Cable 11
Figure 2-6 Rear Panel 12
Figure 3-1 Install RMT: AutoPlay Menu 14
Figure 3-2 Install RMT: Welcome 14
Figure 3-3 Install RMT: Choose Destination Directory 15
Figure 3-4 Install RMT: Create Directory 15
Figure 3-5 Install RMT: Select Program Folder 15
Figure 3-6 Install RMT: WinPcap Setup 16
Figure 3-7 Install RMT: License Agreement 16
Figure 3-8 Install RMT: WinPcap Installation Complete 17
Figure 3-9 Install RMT: Setup Complete 17
Figure 3-10 RMT: Main 18
Figure 3-11 RMT: Selected Switch 19
Figure 3-12 Confirm 20
Figure 4-1 Network: Switch Selection 21
Figure 4-2 Network: Switch Selection: Set 22
Figure 4-3 Network: Switch Database 23
Figure 5-1 Switch Status: Port Status 25
Figure 5-2 Switch Status: MIB Information 26
Figure 5-3 Switch Status: Cable Tester 28
Figure 5-4 Switch Status: Signal Quality 29
Figure 6-1 Switch Configuration: Global Configuration 31
Figure 6-2 Switch Configuration: Port Configuration 32
Figure 6-3 Switch Configuration: Port Configuration: Trunk Setting 33
Figure 6-4 Switch Configuration: Port Configuration: Warning 34

Figure 6-5 Switch Configuration: QoS Configuration 35
Figure 6-6 Switch Configuration: VLAN Configuration 37
Figure 6-7 Switch Configuration: VLAN Configuration: Mode Change Warning 38
Figure 6-8 Switch Configuration: VLAN Configuration: Apply 38
Figure 6-9 Switch Configuration: VLAN Configuration: Port-Based 39
Figure 6-10 Switch Configuration: VLAN Configuration: Port-based: Add 40
Figure 6-11 Port-based VLAN Network Example 40
Figure 6-12 Example: Port-based VLAN Configuration 41
Figure 6-13 Switch Configuration: VLAN Configuration: 802.1Q 42
Figure 6-14 Switch Configuration: VLAN Configuration: 802.1Q: Add 43
Figure 6-15 Switch Configuration: VLAN Configuration: 802.1Q: Port VLAN Mapping 43
Figure 6-16 Example: 802.1Q VLAN Configuration 44
Figure 6-17 Switch Configuration: Port Mirror Configuration 45
Figure 6-18 Switch Configuration: Port Mirror Configuration: Warning 46
Figure 6-19 Example: Port Mirror Configuration 46
Figure 6-20 Switch Configuration: Security Configuration 47
Figure 7-1 Switch Internals: Device Management 48

List of Tables

Table 2-1 The Front Panel: Connector 10
Table 2-2 The Front Panel: Switch 11
Table 2-3 LED 12
Table 3-1 RMT Menu Summary 19
Table 4-1 Network: Switch Selection 21
Table 4-2 Network: Switch Selection: Set 22
Table 4-3 Network: Switch Database 23
Table 5-1 Switch Status: Port Status 25
Table 5-2 Switch Status: MIB Information 26
Table 5-3 Switch Status: MIB Information 27
Table 6-1 Switch Configuration: Global Configuration 31
Table 6-2 Switch Configuration: Port Configuration 32
Table 6-3 Switch Configuration: QoS Configuration 35
Table 6-4 Switch Configuration: VLAN Configuration 37
Table 6-5 Switch Configuration: VLAN Configuration: Port-based 39
Table 6-6 Switch Configuration: VLAN Configuration: 802.1Q 42
Table 6-7 Switch Configuration: Port Mirror Configuration 45

Preface

About This Manual

Thank you for purchasing the Smart Switch Series. Four switch models are discussed in this User's Manual: **16 ports TX smart switch**, **16 ports TX with 1 port FX smart switch**, **24 ports TX smart switch** and **24 ports TX with 2 port FX smart switch**.

This User's Manual is intended for users who have basic networking knowledge and is the primary reference for configuring and maintaining the device. This manual includes description of the management interface and detailed instruction in its use.

Conventions Used

- Mouse click sequence is indicated by the **>** symbol. For example, click **Network > VLAN > Advanced** means for you to click the **Network** link/button, the **VLAN** link/button and then the **Advanced** link/button.
- Notes, warnings or cautions are in **bold** with shaded background.
- In this manual, "the switch" refers to the models discussed unless otherwise stated.

Chapter 1. Introduction

1.1. Overview

This smart switch series are high performance switches with RMT (Remote Management Tool) for remote setting. The switches come with fast Ethernet ports that allow you to easily expand your network by simply connecting computers or network devices to the switch.

Four switch models are discussed in this manual. **16 ports TX smart switch**, **16 ports TX with 1 port FX smart switch**, **24 ports TX smart switch** and **24 ports TX with 2 port FX smart switch**. The additional Fiber uplink interface is shared with one or two Ethernet ports. RMT screens are similar for all switch models. We will use the model **16 ports TX with 1 port FX smart switch** as an example and show the screens for you.

The switch is easy to configure and maintain with the user-friendly Remote Management Tool (RMT) using a unique RRCP (Realtek Remote Control Protocol) protocol. Since the RMT does not use the IP protocol, the switch cannot be managed from the Internet.

In this user manual, the smart switch series will be referred to as the **smart switch**.

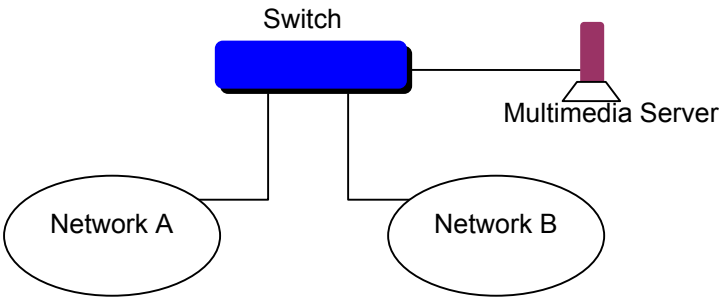
1.2. Main Features

The following lists the main features of the switch.

- Independent per-port bandwidth control
- Bridging capability for 100/10Mbps segments
- Store-and-Forward forwarding scheme
- IEEE 802.3x flow-control support for full-duplex operation
- Back-pressure flow-control support for half-duplex operation
- All ports support Auto-MDI/MDI-X and auto-negotiation
- Supports up to 30 VLAN groups for port-based and IEEE 802.1Q tagged VLAN (the groups number is depended on your settings)
- 4 Trunking groups
- Quality of Service (QoS)
- Port mirroring

1.3. Applications

The following figure shows a network application where the switch is used. In this example, the switch connects the two networks (**A** and **B**) with high-speed access to a multimedia server.


Switch
Multimedia Server
Network A
Network B

Chapter 2. Hardware Installation and Connection

2.1. Package Content

- 1 x switch
- 1 x power cord
- 1 x rack mount kit (optional)
- 4 x rubber feet (for desktop mounting)
- 1 x CD (user manual)
- 1 x QIG

2.2. Safety Warnings

- The length of exposed (bare) power wire should not exceed 7mm.
- Do not use this product near water, for example, in a wet basement.
- Only a qualified technician should service or disassemble this device.

2.3. Hardware Installation

The smart switch series can be rack mountable or set on a desk.

2.3.1. Desktop Mounting

For setting the smart switch on a desk or a flat surface, attached the four rubber feet to the four corners of the smart switch first.

2.3.2. Rack Mounting

If you want to install the smart switch in a 19" rack cabinet, use the included rack mount kit to attach the ears to the smart switch with the screws provided.

When stacking the switch with other devices, leave space between devices to allow airflow.

Do NOT block the ventilating holes.

2.4. Hardware Connection

This section describes the Ethernet ports and the power connection. Port connections are on the front panel.

Figure 2-1 16 ports TX smart switch

Figure 2-2 16 ports TX with 1 port FX smart switch

Figure 2-3 24 ports TX smart switch

Figure 2-4 24 ports TX with 2 port FX smart switch

Table 2-1 The Front Panel: Connector

MODEL	LABEL	DESCRIPTION
16 ports TX smart switch / 16 ports TX with 1 FX smart switch	1 .. 16	There are 16 Ethernet ports on the front panel. Connect a LAN port to a computer using an Ethernet cable.
24 ports TX smart switch / 24 ports TX with 2 FX smart switch	1 .. 24	There are 24 Ethernet ports on the front panel. Connect a LAN port to a computer using an Ethernet cable.
16 ports TX with 1 FX smart switch	Fiber	Connect a Fiber port to a computer using an SC type Fiber cable. This fiber port is shared with Ethernet port 8.
24 ports TX with 2 FX smart switch	Fiber1 /Fiber2	Connect a Fiber port to a computer using an SC type Fiber cable. Fiber1 port is shared with Ethernet port 12 and fiber2 is shared with Ethernet port 12.

Table 2-2 The Front Panel: Switch

MODEL	LABEL	DESCRIPTION
16 ports TX with 1 FX smart switch	SW	Select the activation of Ethernet port 8 or fiber port. Low position: fiber port is selected. High position: Ethernet port 8 is selected.
24 ports TX with 2 FX smart switch	SW1/ SW2	There are two selection switches on the front panel. Select the activation of Ethernet port 12/24 or fiber port 1/2. Low position: fiber port 1/2 is selected. High position: Ethernet port 12/24 is selected.

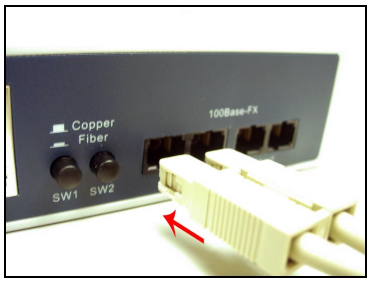
2.4.1. Ethernet Port Connections

For 10/100 Mbps Ethernet connections simply connect a computer or network device to a port on the smart switch using an Ethernet cable.

The **16 ports TX with 1 FX smart switch** and the **24 ports TX with 2 FX smart switch** come with one and two fiber uplink ports respectively for connecting to a high-speed server or inter-connecting with another switch. On the **16 ports TX with 1 FX smart switch**, the uplink port is shared with Ethernet port 8. On the **24 ports TX with 2 FX smart switch**, the uplink ports are shared with Ethernet port 12 and 24. Follow the steps below to show the usage of the fiber port.

1. Power off the smart switch.
2. Connect the fiber cable.

Figure 2-5 Connecting the Fiber Cable



3. Press down the button on the front panel beside the fiber port.
4. Power on the smart switch.

Do NOT connect a telecommunication cable to the fiber port.

To avoid risk of severe eye damage, do NOT look into an operating fiber port and/or fiber connector.

2.4.2. Power Connection

The power socket is located on the rear panel of the switch. Use the power cord to connect this socket to a power source to power on the switch.

Use the power source as labeled on the rear panel.

Figure 2-6 Rear Panel

2.5. LED Description

The following table describes the LEDs on the front panel.

Table 2-3 LED

LED	STATUS	DESCRIPTION
PWR	On	The smart switch is receiving power.
	Off	The smart switch is not receiving power.
LNK/ACT	On	The port is connected and is transmitting data.
	Blinking	The port is connected and is transmitting data.
	Off	The port is not connected.

Chapter 3. The Remote Management Tool

3.1. Overview

The Remote Management Tool (RMT) allows you to configure the switch from a remote location on the network without directly connecting a computer to the switch. If you have more than one switch on the network, you can maintain multiple switches using the RMT.

The RMT uses a unique RRCP protocol that allows you to access and manage the switch through the Ethernet network. This provides management security as the switch is not manageable over the Internet.

You can configure advanced features (such as VLAN, trunking, port mirroring, etc.) using the RMT. You can also back up, restore or reset the smart switch's configuration.

The RMT screens are best view with a screen resolution of 1024 x 768 pixels or higher.

3.2. Installation Requirement

Following are the minimum requirements for your computer to install the RMT.

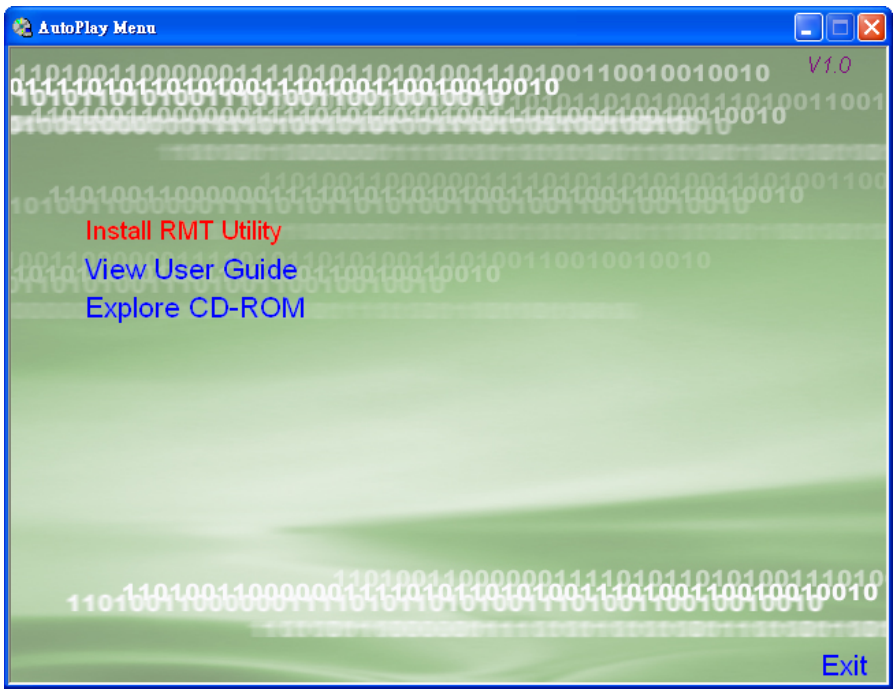
- Pentium compatible processor
- 32 MB of RAM
- Windows 98 SE (Second Edition), Windows ME, Windows NT4.0 (with service pack 6), Windows 2000 or Windows XP

3.3. Installing the RMT

Follow the steps below to install the RMT on your computer.

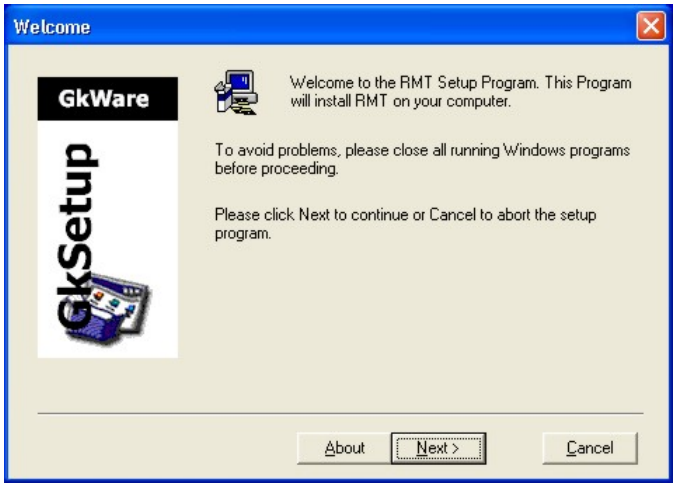
1. Insert the included CD into your CD-ROM drive. The CD should start running automatically. Otherwise, search and double-click "**Autorun.exe**".
2. The **AutoPlay Menu** screen displays. Click **Install RMT Utility**.

Figure 3-1 Install RMT: AutoPlay Menu



3. A **Welcome** screen displays. Click **Next** to continue.

Figure 3-2 Install RMT: Welcome


Welcome
GkWare
GkSetup
Welcome to the RMT Setup Program. This Program will install RMT on your computer.
To avoid problems, please close all running Windows programs before proceeding.
Please click Next to continue or Cancel to abort the setup program.
About
Next >
Cancel

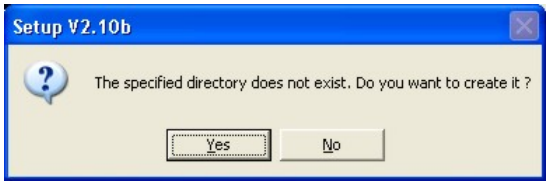
4. Accept the default file location or click **Browse** to specify one. Click **Next** to continue.

Figure 3-3 Install RMT: Choose Destination Directory

Choose Destination Directory
GkWare
GkSetup
Setup will install RMT in the following directory.
To install to this directory, click Next.
To install to a different directory, click Browse and select another directory.
To abort the installation process click Cancel.
Destination Directory
C:\Program Files\RMT V1.00
Browse
< Back
Next >
Cancel

5. A screen displays. Click **Yes** to create the new directory in which the RMT files are saved.

Figure 3-4 Install RMT: Create Directory

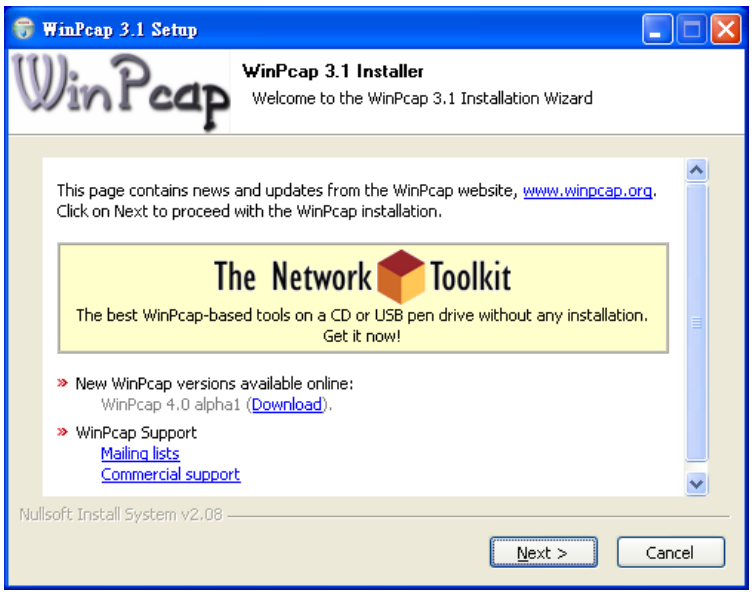


6. In the screen that displays, specify the program folder to which the RMT icon is stored. Click **Next** to continue.

Figure 3-5 Install RMT: Select Program Folder

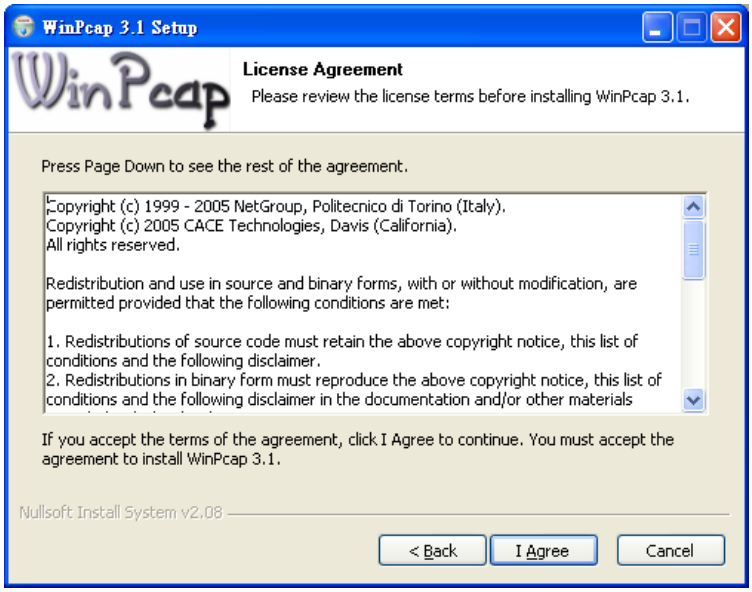
7. A screen displays. Click **Next** to install WinPcap.

Figure 3-6 Install RMT: WinPcap Setup


WinPcap 3.1 Setup
WinPcap 3.1 Installer
Welcome to the WinPcap 3.1 Installation Wizard
This page contains news and updates from the WinPcap website, www.winpcap.org.
Click on Next to proceed with the WinPcap installation.
The Network Toolkit
The best WinPcap-based tools on a CD or USB pen drive without any installation.
Get it now!
New WinPcap versions available online:
WinPcap 4.0 alpha1 (Download).
WinPcap Support
Mailing lists
Commercial support
Nullsoft Install System v2.08
Next >
Cancel

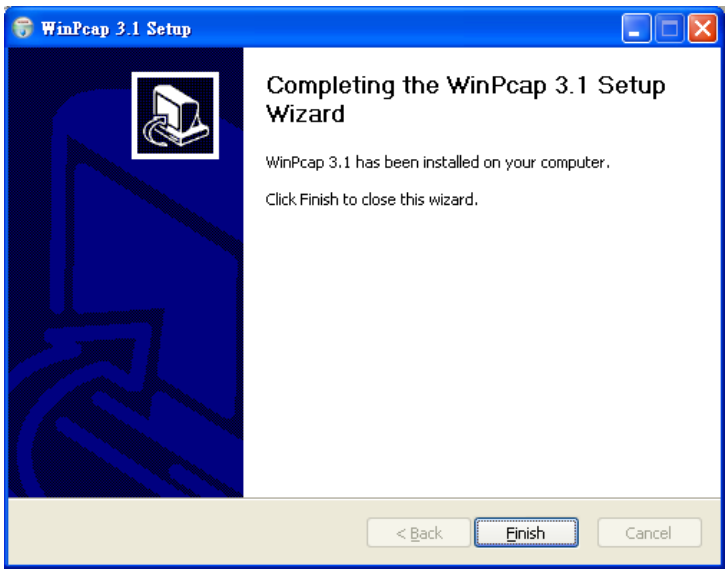
8. In the **License Agreement** screen, click **I Agree** to agree with the license.

Figure 3-7 Install RMT: License Agreement


WinPcap 3.1 Setup
License Agreement
Please review the license terms before installing WinPcap 3.1.
Press Page Down to see the rest of the agreement.
Copyright (c) 1999 - 2005 NetGroup, Politecnico di Torino (Italy).
Copyright (c) 2005 CACE Technologies, Davis (California).
All rights reserved.
Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:
1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install WinPcap 3.1.
Nullsoft Install System v2.08
< Back
I Agree
Cancel

9. After the WinPcap installation process is complete, a screen displays as shown. Click **Finish**.

Figure 3-8 Install RMT: WinPcap Installation Complete



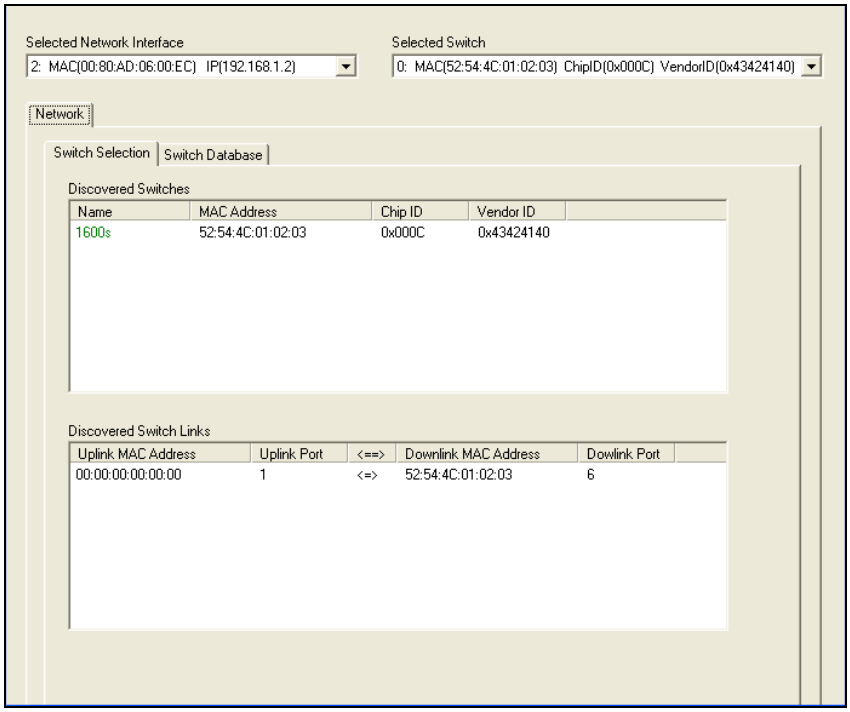
10. When the RMT is installed successfully, a screen displays as shown. Click **Next** to exit.

Figure 3-9 Install RMT: Setup Complete

3.4. Accessing the RMT

Access the RMT from the Windows **Start** menu.

Figure 3-10 RMT: Main

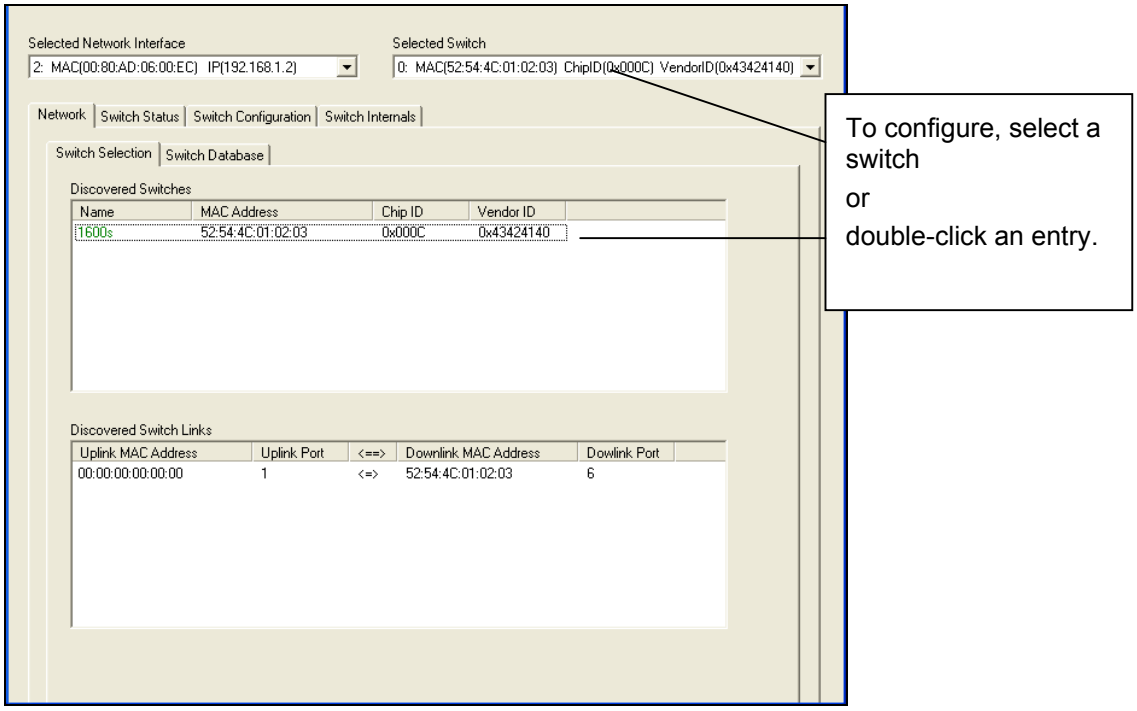


In the **Selected Network Interface** field, select the network card to which the switch is connected. This is applicable if you have more than one network card on your computer.

In the **Selected Switch** field, select the switch you want to manage. You can also double-click on an entry in the **Discovered Switches** table.

You can only configure ONE switch at a time.

Figure 3-11 RMT: Selected Switch



3.5. RMT Menu Summary

The following table lists the menus in the RMT.

Table 3-1 RMT Menu Summary

NETWORK	SWITCH STATUS	SWITCH CONFIGURATION	SWITCH INTERNALS
Switch Selection Switch Database	Port Status MIB Information Cable Tester Signal Quality	Global Configuration Port Configuration QoS Configuration VLAN Configuration Port Mirror Configuration Security Configuration	Device Management

3.6. Exiting the RMT and Saving Configuration

To close and exit from the RMT, simply click the close button on the upper right corner.

A **Confirm** screen displays prompting you to save the configuration changes to the switch. Click **Yes** to save the changes and close the screen. Click **No** to discard all changes and close the screen. Click **Cancel** to close the **Confirm** screen without exiting the RMT.

Figure 3-12 Confirm

Chapter 4. Network

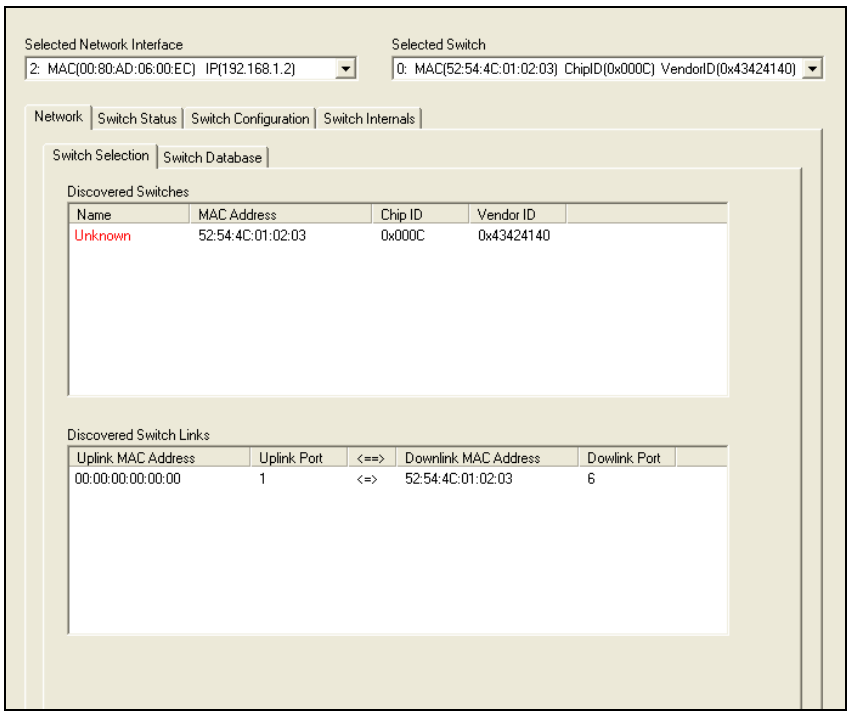
4.1. Switch Selection

Display the **Switch Selection** screen to view the information of all switches. Click **Network > Switch Selection** to display the screen.

When you run the RMT, the RMT will automatically search for all the RRCP-enabled switches on the network and display the information in the **Discovered Switches** list table.

Select a switch for management from the **Selected Switch** field. You can only manage one smart switch at a time.

Figure 4-1 Network: Switch Selection



The following table describes the labels in this screen.

Table 4-1 Network: Switch Selection

LABEL	DESCRIPTION
Discovered Switches	This table displays the information all RRCP-enabled switches found on the network. Double-click an entry to manage the switch. Right-click on an entry to add the switch information to the database.
Name	This field displays a descriptive name for the switch. This field displays **Unknown** if the switch information is not in the **Switch Database** screen.

Table 4-1 Network: Switch Selection

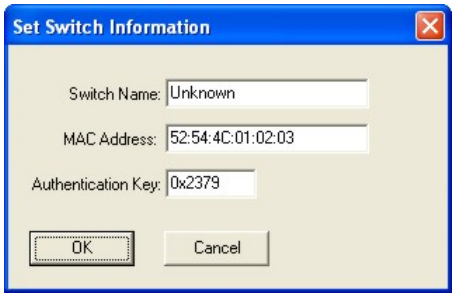
LABEL	DESCRIPTION
MAC Address	This field displays the MAC address of the switch in six pairs of hexadecimal notation.
Chip ID	This field displays the hardware number of the switch.
Vendor ID	This field displays the ID of the switch manufacturer.
Discovered Switch Links	This table displays the connection information to the switch(es).
Uplink MAC Address	This field displays the MAC address of the uplink port on the switch.
Uplink Port	This field displays the uplink port number.
Downlink MAC Address	This field displays the MAC address of the connected downlink port.
Downlink Port	This field displays the connected Ethernet port number.

4.1.1. Adding a Switch to the Database

Follow the steps below to add a switch to the database.

1. Click **Network > Switch Selection**.
2. In the **Discovered Switches** table, right-click on an entry and select **Add to Switch Database**.
3. A **Set Switch Information** screen displays.

Figure 4-2 Network: Switch Selection: Set



The following table describes the labels in this screen.

Table 4-2 Network: Switch Selection: Set

LABEL	DESCRIPTION
Switch Name	Enter a descriptive name for the switch.
MAC Address	This field displays the MAC address of the switch. You may change the MAC address here.

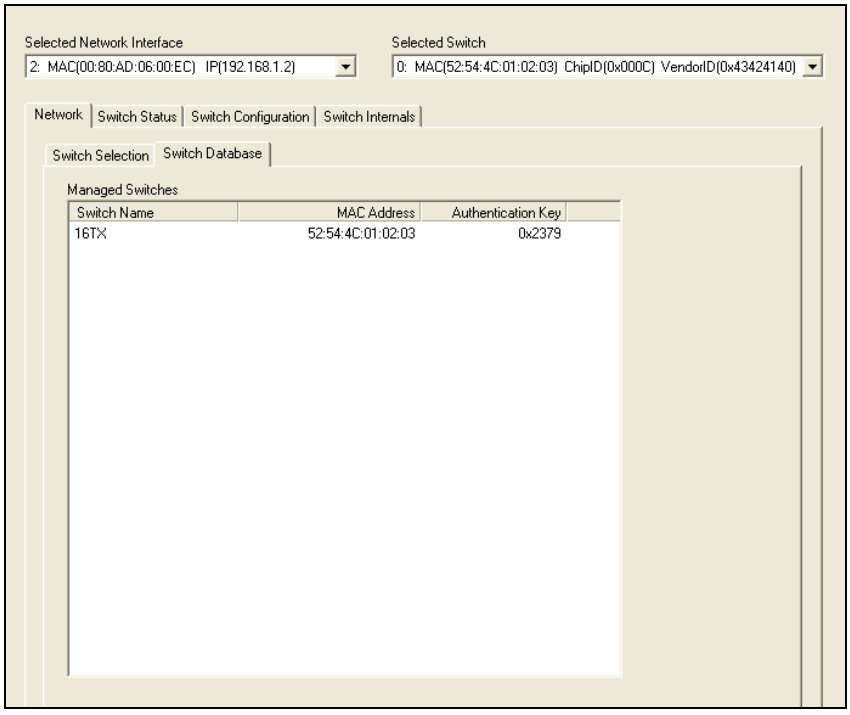
Table 4-2 Network: Switch Selection: Set

LABEL	DESCRIPTION
	NOTE: This does NOT change the hardware MAC address on the switch.
Authentication Key	Accept the default or enter the security key for the RMT to access the switch for management.
OK	Click **OK** to save the settings in the RMT. You can view the switch information in the **Switch Database** screen (see *Figure 4-3*).
Cancel	Click **Cancel** to discard all changes and close this screen.

4.2. Switch Database

You can view the information of the switch(es) you added to the database in the **Switch Database** screen. Click **Network > Switch Database** to display the screen.

Figure 4-3 Network: Switch Database



The following table describes the labels in this screen.

Table 4-3 Network: Switch Database

LABEL	DESCRIPTION
Switch Name	This field displays a descriptive name for the switch.
MAC Address	This field displays the MAC address of the switch.

Table 4-3 Network: Switch Database

LABEL	DESCRIPTION
Authentication Key	This field displays the security key for the RMT to access the switch for management.

4.2.1. Adding a Switch

You can add a device in the Switch Database screen for management.

1. Click **Network > Switch Database**.
2. Right-click in the **Managed Switches** table and click **Add**.
3. A **Set Switch Information** screen displays. Configure this screen and click **OK** to insert a new entry in the database. Refer to *Table 4-2* for the field descriptions.

4.2.2. Editing Switch Information

Follow the steps below to modify the information of the selected switch.

1. Click **Network > Switch Database**.
2. Right-click on a switch entry in the **Managed Switches** table and click **Edit**.
3. A **Set Switch Information** screen displays. Make the changes and click **OK**.

4.2.3. Deleting a Switch

In the **Switch Database** screen, right-click on a switch and click **Delete** to remove the selected switch from the database.

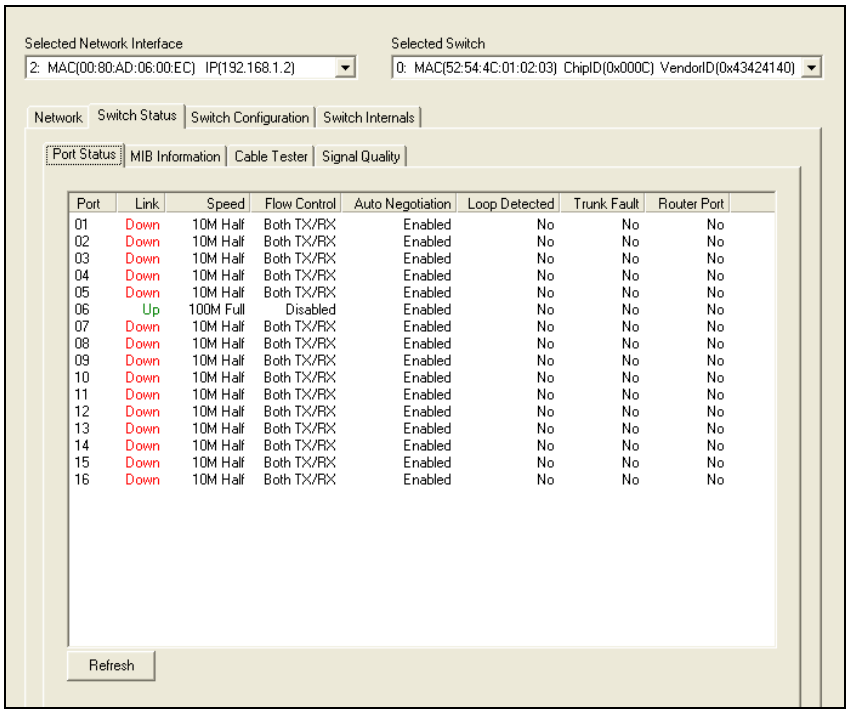
Chapter 5. Switch Status

5.1. Port Status

Use the Port Status screen to view the status on the switch ports.

Click **Switch Status > Port Status** to display the screen.

Figure 5-1 Switch Status: Port Status


Selected Network Interface
2: MAC(00:80:AD:06:00:EC) IP(192.168.1.2)
Selected Switch
0: MAC(52:54:4C:01:02:03) ChipID(0x000C) VendorID(0x43424140)
Network
Switch Status
Switch Configuration
Switch Internals
Port Status
MIB Information
Cable Tester
Signal Quality
Port Link Speed Flow Control Auto Negotiation Loop Detected Trunk Fault Router Port
01 Down 10M Half Both TX/RX Enabled No No No
02 Down 10M Half Both TX/RX Enabled No No No
03 Down 10M Half Both TX/RX Enabled No No No
04 Down 10M Half Both TX/RX Enabled No No No
05 Down 10M Half Both TX/RX Enabled No No No
06 Up 100M Full Disabled Enabled No No No
07 Down 10M Half Both TX/RX Enabled No No No
08 Down 10M Half Both TX/RX Enabled No No No
09 Down 10M Half Both TX/RX Enabled No No No
10 Down 10M Half Both TX/RX Enabled No No No
11 Down 10M Half Both TX/RX Enabled No No No
12 Down 10M Half Both TX/RX Enabled No No No
13 Down 10M Half Both TX/RX Enabled No No No
14 Down 10M Half Both TX/RX Enabled No No No
15 Down 10M Half Both TX/RX Enabled No No No
16 Down 10M Half Both TX/RX Enabled No No No
Refresh

The following table describes the labels in this screen.

Table 5-1 Switch Status: Port Status

LABEL	DESCRIPTION
Port	This field displays the port number.
Link	This field displays the link status. This field displays **Up** if a device is connected to this port. This field displays **Down** if this port is not connected.
Speed	This field displays the connection speed on the port.
Flow Control	This field displays whether flow control is activated on the port.
Auto Negotiation	Auto negotiation allows the port to automatically detect and use the best connection speed and duplex mode that are supported on the peer device.

Table 5-1 Switch Status: Port Status

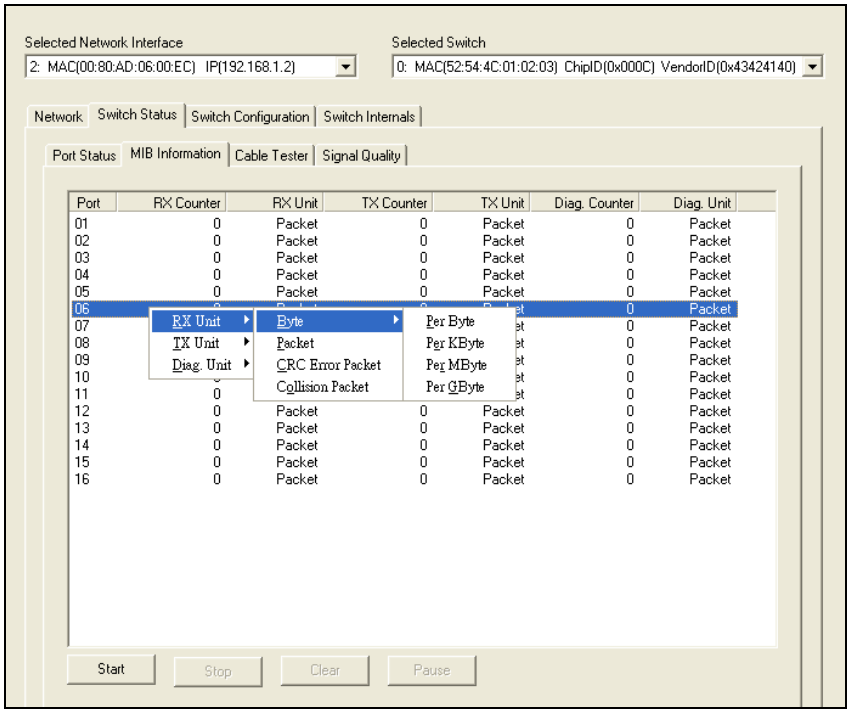
LABEL	DESCRIPTION
	This field displays whether this feature is activated on the port.
Loop Detected	This field displays whether a network loop is detected on this port.
Trunk Fault	This field displays whether this port is down in a trunk group.
Router Port	This field displays whether this port is used for routing packets.
Refresh	Click **Refresh** to update this screen.

5.2. MIB Information

Use the **MIB Information** screen to start collecting port statistics and see the amount of traffic received or transmitted on the ports. Click **Switch Status > MIB Information** to display the screen.

Right-click to change the counter unit.

Figure 5-2 Switch Status: MIB Information



The following table describes the labels in this screen.

Table 5-2 Switch Status: MIB Information

LABEL	DESCRIPTION
Port	This field displays the port number.

Table 5-2 Switch Status: MIB Information

LABEL	DESCRIPTION
RX Counter	This field displays the amount of traffic received on the port.
RX Unit	This field displays the traffic unit on the port.
TX Counter	This field displays the amount of traffic transmitted on the port.
TX Unit	This field displays the traffic unit on the port.
Diag. Counter	This field displays the total amount of traffic received/transmitted on the port.
Diag. Unit	This field displays the traffic unit on the port.
Start	Click **Start** to start counting the traffic through the ports. The information is automatically updated in this screen.
Stop	Click **Stop** to stop counting the traffic through the ports. You must click **Start** again to update the information in this screen.
Clear	Click **Clear** to reset the counters.
Pause/Continue	Click **Pause** to stop counting the traffic through the ports. Click **Continue** to resume the counter update.

5.2.1. Changing the Counter Unit

To change the counter unit, right-click the mouse in the **MIB Information list** table.

The following table shows the options you can select.

Table 5-3 Switch Status: MIB Information

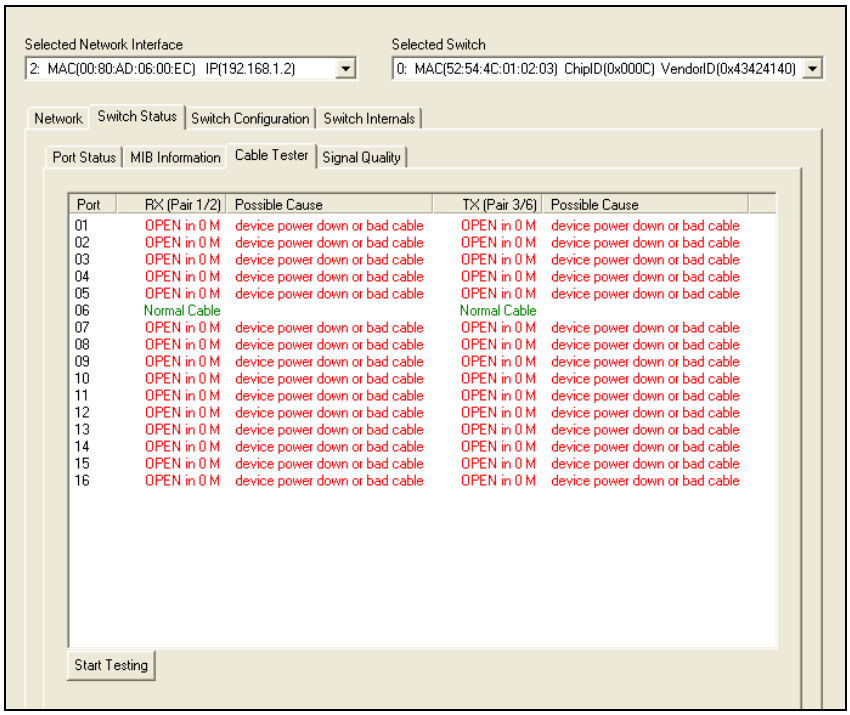
COUNTER UNIT	OPTION
Byte	Per Byte Per KByte Per MByte Per GByte
Packet	
CRC Error Packet	
Collision Packet	

5.3. Cable Tester

You can test port connection in the **Cable Tester** screen. This allows you to diagnose the port cable links and determine possible connection problems.

Click **Switch Status > Cable Tester** to display the screen. Click **Start Testing** to begin the test.

Figure 5-3 Switch Status: Cable Tester



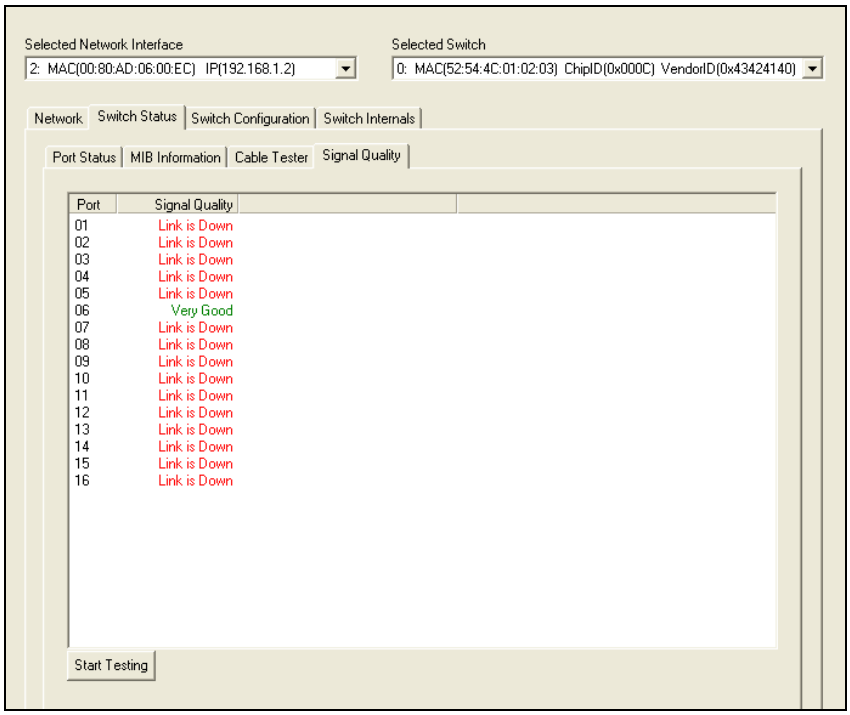
Port	RX (Pair 1/2)	Possible Cause	TX (Pair 3/6)	Possible Cause
01	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
02	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
03	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
04	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
05	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
06	Normal Cable		Normal Cable	
07	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
08	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
09	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
10	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
11	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
12	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
13	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
14	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
15	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable
16	OPEN in 0 M	device power down or bad cable	OPEN in 0 M	device power down or bad cable

5.4. Signal Quality

Check the port transmission quality in the **Signal Quality** screen. The RMT checks the Signal to Noise Ratio (SNR) for the transmission quality.

Click **Switch Status > Signal Quality** and click **Start Testing** to begin the test.

Figure 5-4 Switch Status: Signal Quality

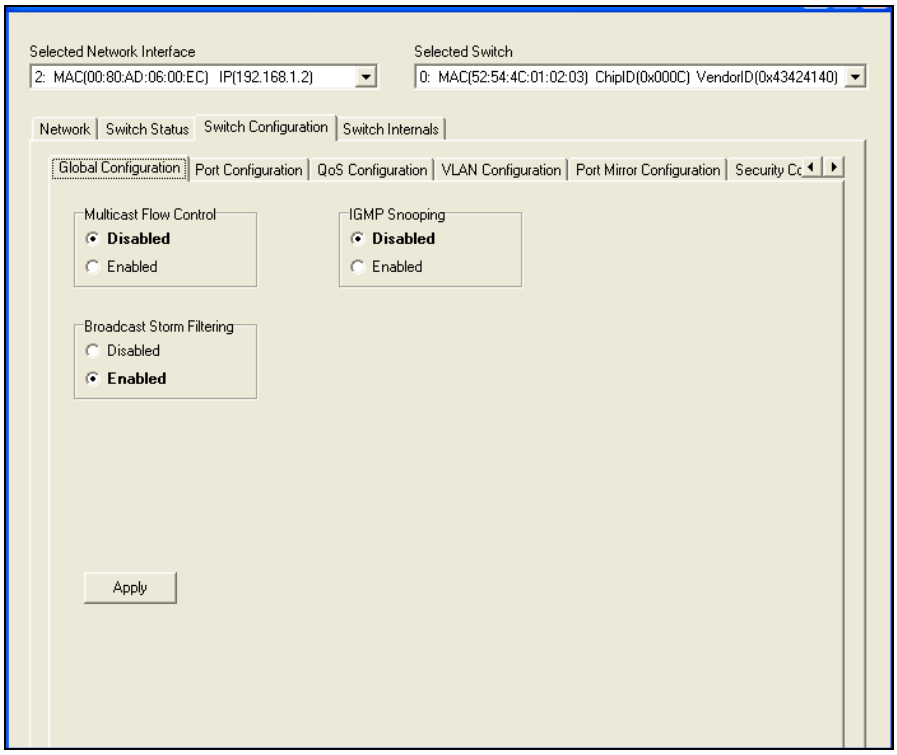


Chapter 6. Switch Configuration

6.1. Global Configuration

Set the system-wide settings in the **Global Configuration** screen. Click **Switch Configuration > Global Configuration** to display the screen.

Figure 6-1 Switch Configuration: Global Configuration



The following table describes the labels in this screen.

Table 6-1 Switch Configuration: Global Configuration

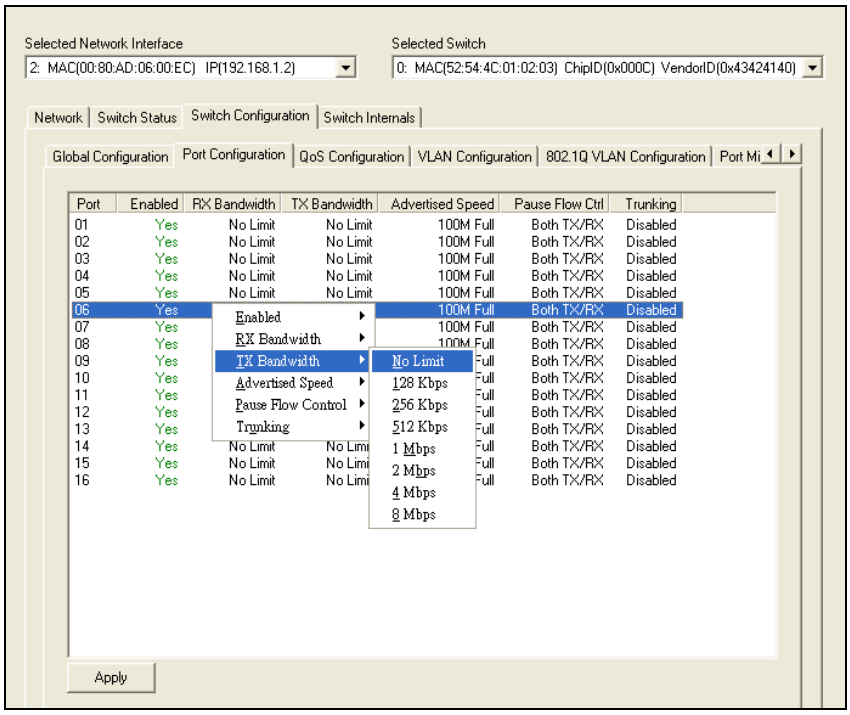
LABEL	DESCRIPTION
Multicast Flow Control	Select **Disable** to drop multicast packets on the switch. Select **Enabled** to transmit multicast packets. This may reduce performance in a busy network.
Broadcast Storm Filtering	Select **Disable** to drop broadcast packets received on the switch. Select **Enabled** to receive broadcast packets. This may reduce performance in a busy network.
IGMP Snooping	Select **Disable** to deactivate IGMP snooping on the switch. Select **Enabled** to activate IGMP snooping on the switch.
Apply	Click **Apply** to save the changes in the RMT.

6.2. Port Configuration

Set the port settings in the **Port Configuration** screen. Click **Switch Configuration > Port Configuration** to display the screen.

To change the port settings in this screen, right-click and select the options.

Figure 6-2 Switch Configuration: Port Configuration



The following table describes the labels in this screen.

Table 6-2 Switch Configuration: Port Configuration

LABEL	DESCRIPTION
Port	This field displays the port number.
Enabled	This field displays whether the port is activated (**Yes)** or deactivated (**No**). Right-click on a port and click **Enabled** and an option to activate or deactivate the port.
RX Bandwidth	This field displays the bandwidth allowed for receiving traffic. Right-click on a port and click **RX Bandwidth** to restrict the receiving bandwidth. Select **No Limit** if you want to use the port's total bandwidth for receiving traffic.
TX Bandwidth	This field displays the bandwidth allowed for transmitting traffic. Right-click on a port and click **TX Bandwidth** to restrict the transmission bandwidth. Select **No Limit** if you want to use the port's total bandwidth for transmitting traffic.
Advertising Speed	This field displays the port speed and duplex mode. Right-click on a port and select **Advertising Speed** to configure the port speed and duplex mode.

Table 6-2 Switch Configuration: Port Configuration

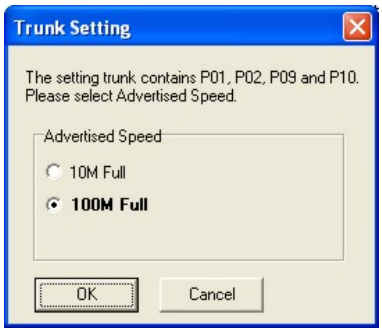
LABEL	DESCRIPTION
Pause Flow Ctrl	This field displays whether flow control is activated.
Trunking	This field displays whether the port is a member of the trunk group.
Apply	Click **Apply** to save the changes.

6.2.1. Trunk Group Setting

You can configure up to four trunk groups on the switch. In the **Port Configuration** screen, right-click and click **Trunking > Enabled** to activate trunking on the selected port. A **Trunk Setting** screen displays as shown. The screen displays the port numbers belonging to the trunk group.

Select the trunk speed. Make sure the peer device to which this trunk connects is also set to use the same speed. Click **OK** to save the setting and close this screen.

Figure 6-3 Switch Configuration: Port Configuration: Trunk Setting

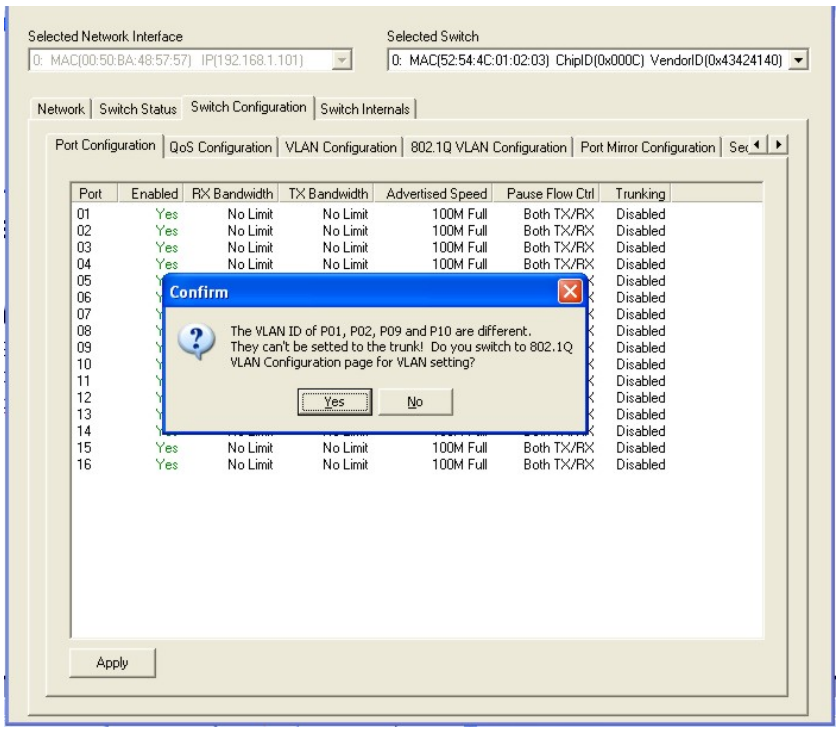


6.2.2. VLAN and Trunking

Ports in the same trunking group must belong to the same VLAN group. If you set the trunk port members to be in different VLAN groups, a warning screen displays when you enable trunking in the **Port Configuration** screen.

Click **Yes** in the warning screen to display the **Port-based VLAN Configuration** or the **802.1Q VLAN Configuration** screen and change the VLAN settings. Refer to *Section 6.5.* for more information on VLAN.

Figure 6-4 Switch Configuration: Port Configuration: Warning


Selected Network Interface
0: MAC(00:50:BA:48:57:57) IP(192.168.1.101)
Selected Switch
0: MAC(52:54:4C:01:02:03) ChipID(0x000C) VendorID(0x43424140)
Network
Switch Status
Switch Configuration
Switch Internals
Port Configuration
QoS Configuration
VLAN Configuration
802.1Q VLAN Configuration
Port Mirror Configuration
Port
Enabled
RX Bandwidth
TX Bandwidth
Advertised Speed
Pause Flow Ctrl
Trunking
01 Yes No Limit No Limit 100M Full Both TX/RX Disabled
02 Yes No Limit No Limit 100M Full Both TX/RX Disabled
03 Yes No Limit No Limit 100M Full Both TX/RX Disabled
04 Yes No Limit No Limit 100M Full Both TX/RX Disabled
15 Yes No Limit No Limit 100M Full Both TX/RX Disabled
16 Yes No Limit No Limit 100M Full Both TX/RX Disabled
Confirm
The VLAN ID of P01, P02, P09 and P10 are different.
They can't be setted to the trunk! Do you switch to 802.1Q
VLAN Configuration page for VLAN setting?
Yes
No
Apply

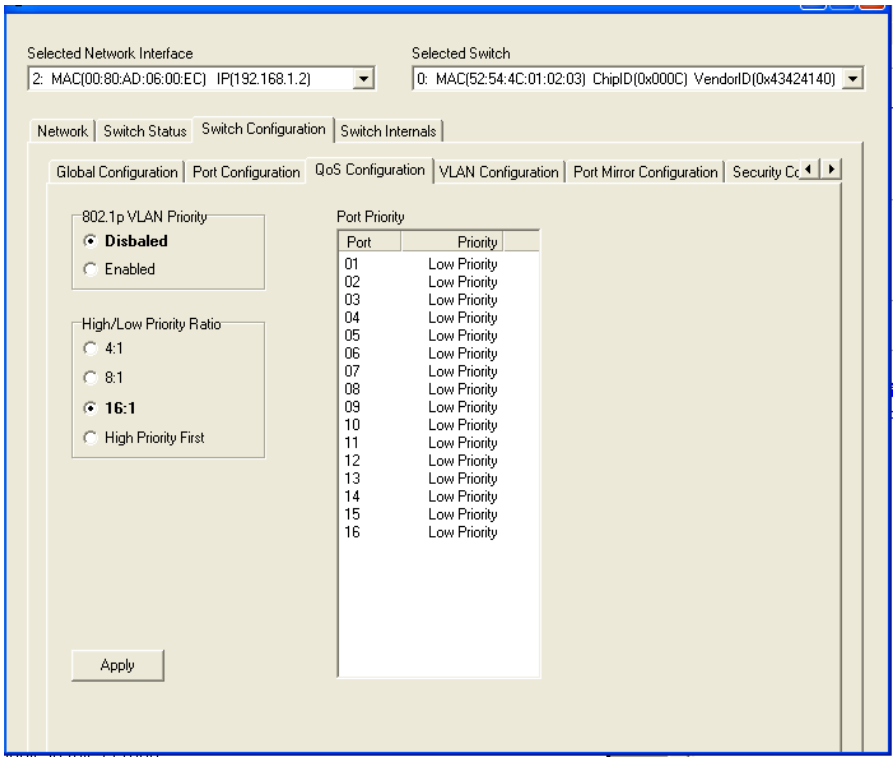
6.3. Quality of Service (QoS) Configuration

Configure QoS features to allow preferential treatment to specific IP packets. This ensures that high priority packets are delivered efficiently, even during bursts of heavy traffic. If you plan to implement telephony, video conferencing or any real-time applications (such as VoIP), you should configure QoS settings on this switch to dramatically improve service quality. Otherwise, the quality of these services depends on the load of your network.

Click **Switch Configuration > QoS Configuration** to display the configuration screen.

The switch provides two priority settings (**High** and **Low**). You can set the priority settings based on TOC/DiffServ, VLAN tag or a port.

Figure 6-5 Switch Configuration: QoS Configuration



The following table describes the labels in this screen.

Table 6-3 Switch Configuration: QoS Configuration

LABEL	DESCRIPTION
802.1p VLAN Priority	Select **Enabled** to set the switch to prioritize VLAN tagged packets. VLAN tagged packets with priority levels 0 through 3 are treated as high priority. Priority levels 4 through 7 are treated as low priority. Select **Disabled** to set the switch not to prioritize VLAN tagged packets.
High/Low Priority Ratio	Select **4:1**, **8:1** or **16:1** to set the switch to assign the selected ratio of the bandwidth for transmitting high and low priority packets respectively. Select **Disabled** to disable this feature.
Port Priority	This list displays the priority of the port. To set the priority of the ports, right-click and select **Low Priority** or **High Priority**.
Port	This field displays the port number.
Priority	This field displays the priority level (**High Priority** or **Low Priority**) of the port. If a port is set to high priority, it means all traffic to the port is prioritizes and processed first.
Apply	Click **Apply** to save the changes in the RMT.

6.4. Introduction to VLAN

Virtual LANs are logical grouping of devices on different network segments and allows the

users to communicate as if they were connected to a single network. With VLAN, you can group or segment your network and allow certain user groups to access certain network resources. For example, you can allow only the users from the sales department to access pricing information on the company network via VLAN setting. The pricing information is not accessible to other departments in the same company.

Thus VLANs provide improved performance, manageability and security. Your switch supports two VLAN modes: port-based and 802.1q tagged.

The switch has a predefined VLAN (the Default VLAN) to which all ports belong.

6.4.1. Port-Based VLAN

In port-based VLAN, you set a port to be a member of a VLAN. For example, you can assign pots 1, 2, 3 and 4 to belong to the sales VLAN and ports 5, 6, 7 and 8 to the marketing VLAN.

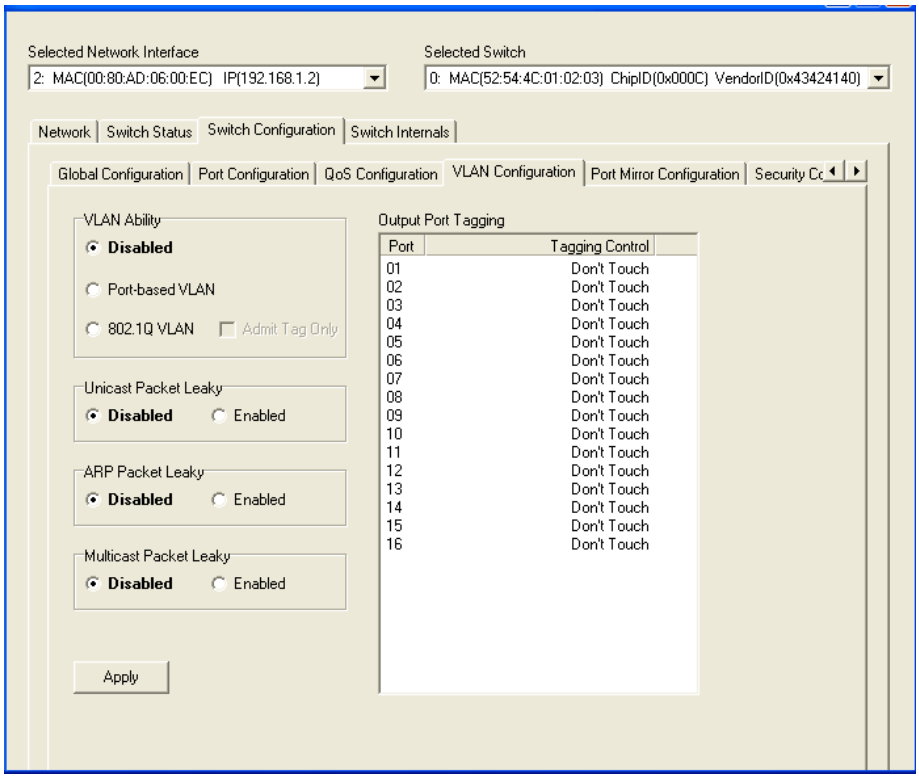
6.4.2. 802.1q Tagged VLAN

In 802.1q tagged VLAN, the VLAN information is contained in the frames (known as tagged frames). When the switch receives tagged frames, it sends the frames to only ports that belong to the same VLAN. In addition, the switch is able to add VLAN information to frames before transmitting.

6.5. VLAN Configuration

To configure VLAN settings on the switch, click **Switch Configuration > VLAN Configuration**.

Figure 6-6 Switch Configuration: VLAN Configuration



The following table describes the labels in this screen.

Table 6-4 Switch Configuration: VLAN Configuration

LABEL	DESCRIPTION
VLAN Ability	Select **Disable** to deactivate the VLAN function. Select **Port-based VLAN** to set the switch to operate in port-based VLAN mode. Select **802.1Q VLAN** to set the switch to operate in tagged VLAN mode. Select **Admit Tag Only** to set the switch to drop frames without VLAN information. **NOTE**: When you change the VLAN mode, a warning screen displays. Click **OK** and **Apply** to complete the mode change.
Unicast Packet Leaky	Select **Enabled** to allow unicast packets to travel to different VLANs. Select **Disabled** to deactivate this feature. Unicast packets can only travel to the specified VLAN.
ARP Packet Leaky	Select **Enabled** to allow ARP packets to travel to different VLANs. Select **Disabled** to deactivate this feature. ARP packets can only travel to the specified VLAN.
Multicast Packet Leaky	Select **Enabled** to allow multicast packets to travel to different VLANs. Select **Disabled** to deactivate this feature. Multicast packets can only travel to the specified VLAN.
Output Port Filtering	Use this table to configure whether the switch is to add VLAN information to outgoing packets.
Port	This field displays the port number.
Tagging	Right-click and select a tagging option.

Table 6-4 Switch Configuration: VLAN Configuration

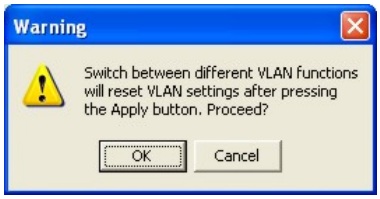
LABEL	DESCRIPTION
Control	Select **Don't Touch** to set the switch not to add VLAN information to the outgoing frames. Select **Remove Tags** to set the switch to remove VLAN tags from frames before transmitting. Select **Add Tag (for all frames)** to set the switch to add VLAN information to outgoing frames. Select **Add Tag (for high priority frames)** to set the switch to add VLAN information to outgoing frames with the high priority setting.
Apply	Click **Apply** to save the settings.

6.5.1. Changing the VLAN Mode

Follow the steps below to change the VLAN mode on the switch.

1. Click **Switch Configuration > VLAN Configuration**.
2. Under **VLAN Ability**, select **Port-based VLAN** or **802.1Q VLAN**.
3. A warning screen displays. Click **OK** to set the VLAN mode and close this screen.

Figure 6-7 Switch Configuration: VLAN Configuration: Mode Change Warning


Warning
Switch between different VLAN functions will reset VLAN settings after pressing the Apply button. Proceed?
OK
Cancel

4. In the **VLAN Configuration** screen, click **Apply**.
5. When the VLAN mode change is complete, a screen displays as shown. Click **OK** to close the screen.

Figure 6-8 Switch Configuration: VLAN Configuration: Apply

The Port-based VLAN Configuration or 802.1Q VLAN Configuration tab shows.

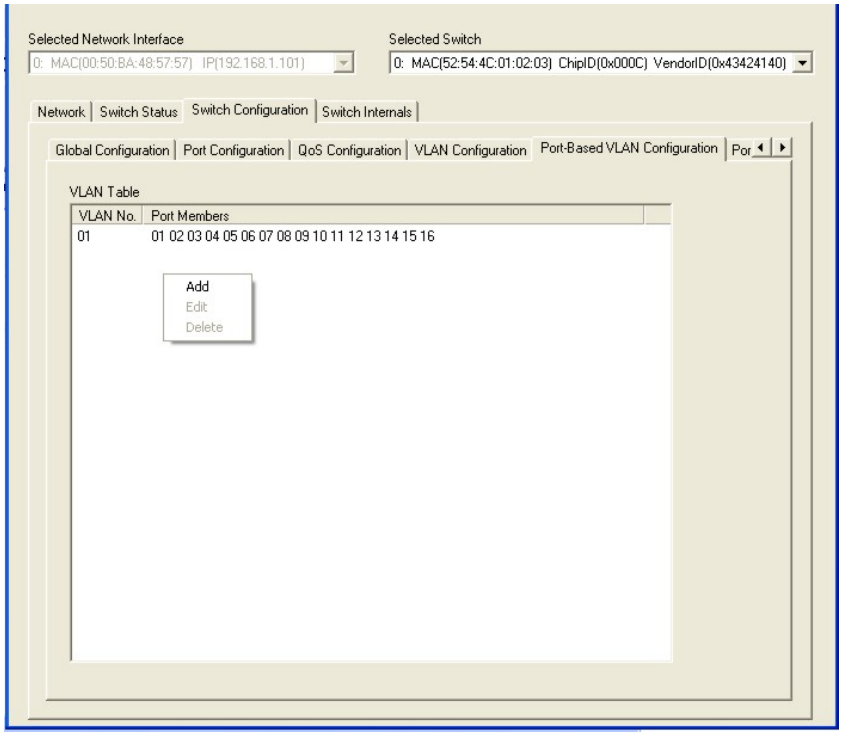
6.5.2. Port-Based VLAN Configuration

When you select **Port-based VLAN** in the **VLAN Configuration** screen and click **Apply**, the **Port-Based VLAN Configuration** screen displays. Use this screen to set port-based VLANs.

Right-click on the VLAN Table **to create, modify or delete a VLAN.**

You cannot delete or modify the default VLAN (with VLAN ID 01) to which all ports belong. Port members are eliminated from the default VLAN when you add the ports to other VLANs.

Figure 6-9 Switch Configuration: VLAN Configuration: Port-Based



The following table describes the labels in this screen.

Table 6-5 Switch Configuration: VLAN Configuration: Port-based

LABEL	DESCRIPTION
VLAN Table	This list displays the VLANs and port members. Right-click to create, modify or delete a VLAN.
VLAN No.	This field displays the VLAN ID.
Port Members	This field displays the number of the port belonging to the VLAN.

Creating a Port-based VLAN

You can create up to 32 VLANs on the switch.

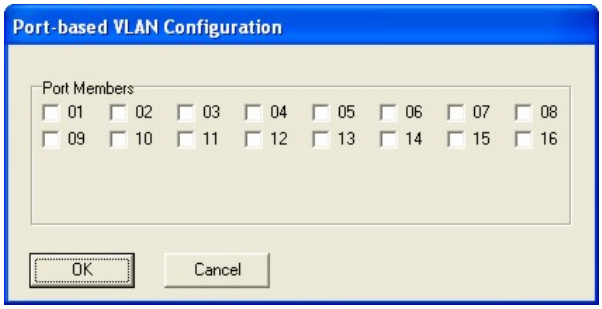
Follow the steps below to add a new port-based VLAN.

1. Right-click on the **VLAN Table** in the **Port-based VLAN Configuration** screen and click **Add**.
2. The following screen displays. A screen displays. Select the ports you intend to set in this

VLAN group.

3. Click **OK** to save the changes and close this screen.

Figure 6-10 Switch Configuration: VLAN Configuration: Port-based: Add

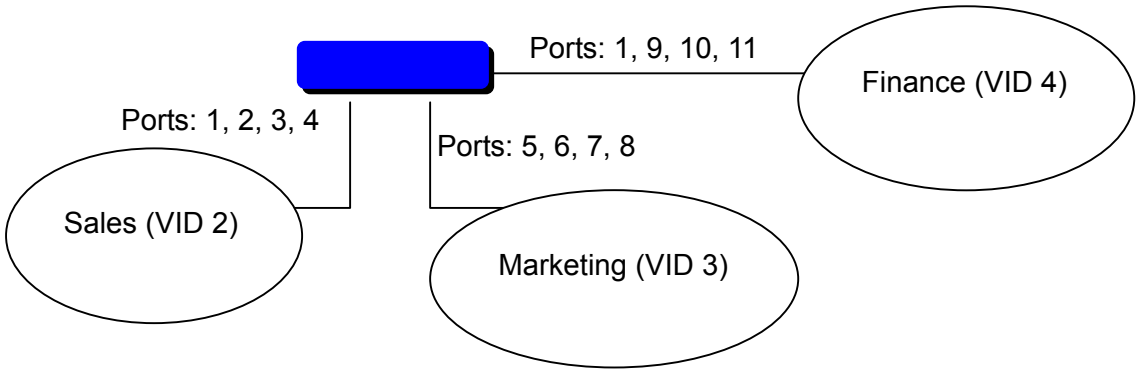


4. The new VLAN displays in the **VLAN Table** list.

Example: Port-based VLAN

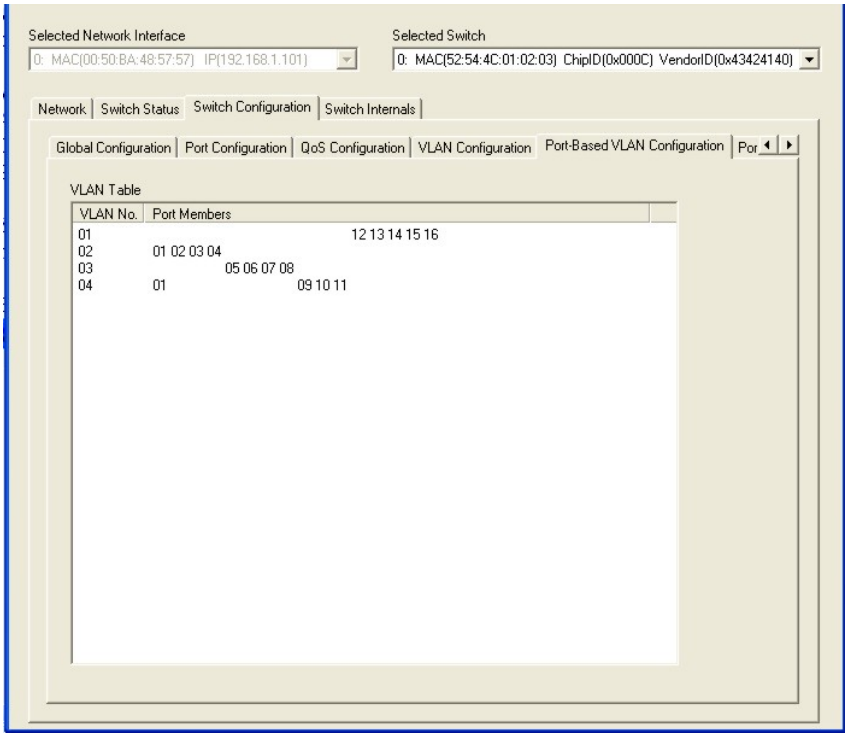
In the following network example, switch ports 1, 2, 3, and 4 belong to the sales VLAN group (VLAN ID 02), ports 5, 6, 7, and 8 belong to the marketing VLAN group (VLAN ID 03) and ports 1, 9, 10, and 11 belong to the finance VLAN group (VLAN ID 04).

Figure 6-11 Port-based VLAN Network Example



For the network example, add port-based VLANs 02, 03 and 04 as shown in the following figure.

Figure 6-12 Example: Port-based VLAN Configuration



If you do not activate a leaky VLAN feature in the VLAN Configuration screen, a unicast packet (for example) received on port 1 will be sent to ports 2, 3, 4, 9, 10 and 11 only.

6.5.3. 802.1q Tagged VLAN

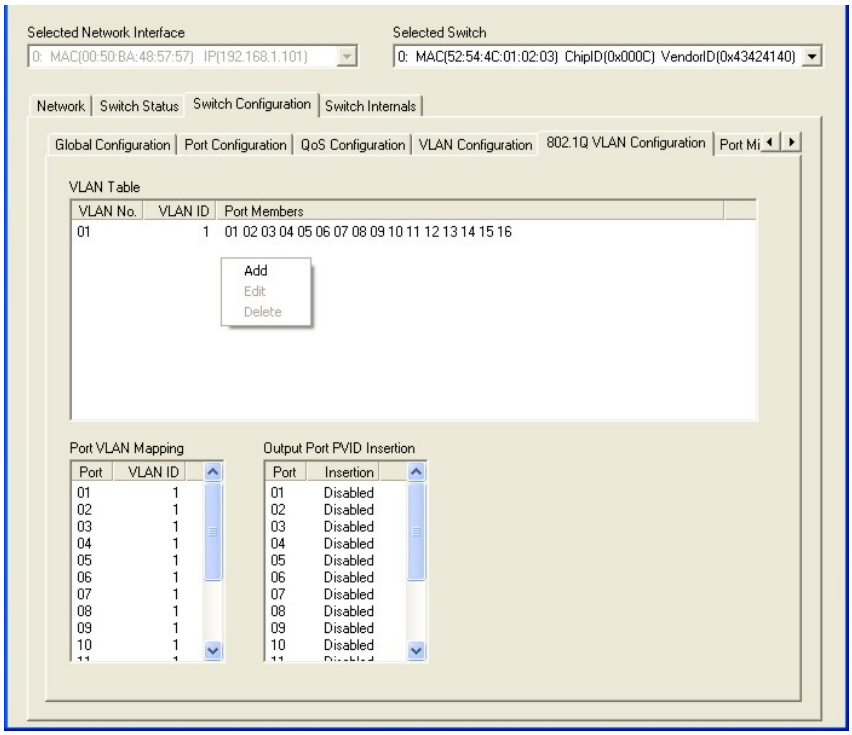
In 802.1q tagged VLAN, the VLAN information is contained in the frames (known as tagged frames). When the switch receives tagged frames, it sends the frames to only ports that belong to the same VLAN. In addition, the switch is able to add VLAN information to frames before transmitting.

When you select **802.1Q VLAN** in the **VLAN Configuration** screen and click **Apply**, the **802.1Q VLAN Configuration** screen displays. Use this screen to set 802.1q VLANs.

Right-click on the VLAN Table **to create, modify or delete a VLAN.**

You cannot delete or modify the default VLAN (with VLAN ID 01) to which all ports belong.

Figure 6-13 Switch Configuration: VLAN Configuration: 802.1Q



The following table describes the labels in this screen.

Table 6-6 Switch Configuration: VLAN Configuration: 802.1Q

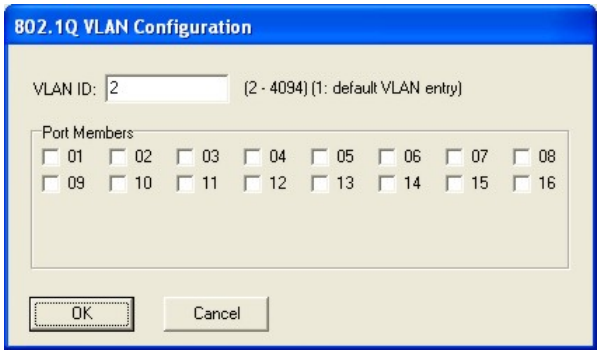
LABEL	DESCRIPTION
Label	Description
VLAN Table	This list displays the VLANs and port members. Right-click to create, modify or delete a VLAN.
VLAN No.	This field displays the index number.
VLAN ID	This field displays the number that identifies the VLAN.
Port Members	This field displays the number of the port belonging to the VLAN.
Port VLAN Mapping	Right-click on a port entry and click **Set VLAN ID** to specify the ID of the VLAN to which the switch sends untagged packets received on this port. This also sets the switch to add the selected VLAN ID information to outgoing packets.
Output Port PVID Insertion	Specify whether to add VLAN information to packets to a port. Right-click on a port and click **Enabled** or **Disabled**.

Creating a 802.1Q Tagged VLAN

Follow the steps below to add a new port-based VLAN.

1. Right-click on the **VLAN Table** in the **802.1Q VLAN Configuration** screen and click **Add**.
2. A screen displays. Enter a unique number (2 to 4094) in the **VLAN ID** field to identify this VLAN.
3. Select the ports to belong to the VLAN.
4. Click **OK** to save the changes and close this screen.

Figure 6-14 Switch Configuration: VLAN Configuration: 802.1Q: Add

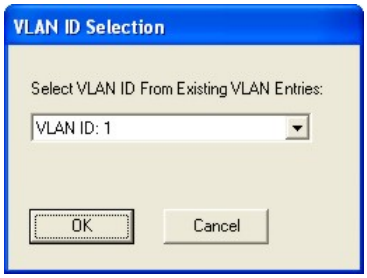

802.1Q VLAN Configuration
VLAN ID: 2
(2 - 4094) (1: default VLAN entry)
Port Members
01 02 03 04 05 06 07 08
09 10 11 12 13 14 15 16
OK
Cancel

Port VLAN Mapping

Use the **VLAN ID Selection** screen to specify the VLAN to which untagged packets received on the port are sent. For example, if you set the output VLAN ID of port 2 to 10, all untagged packets received on port 2 are sent to the port(s) belong to VLAN 10.

Right-click on an entry in the **Port VLAN Mapping list** and click **Set VLAN ID** in the **802.1Q VLAN Configuration** screen to display the **Port VLAN Mapping** screen. Select a VLAN ID and click **OK** to save the settings.

Figure 6-15 Switch Configuration: VLAN Configuration: 802.1Q: Port VLAN Mapping



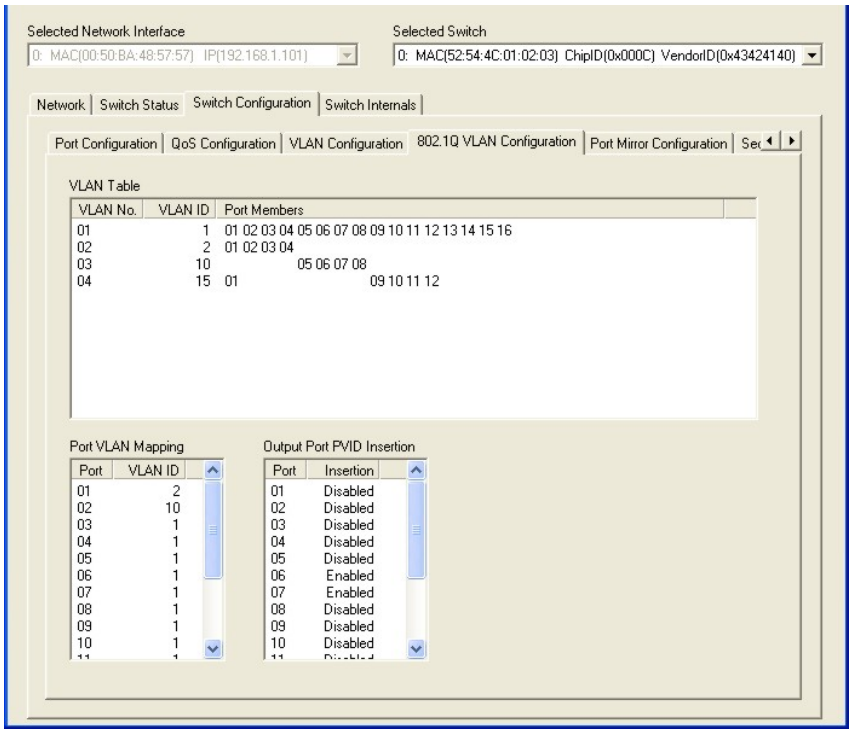
Example: 802.1Q VLAN

In the following VLAN example, switch ports 1, 2, 3 and 4 belong to VLAN ID 2, ports 5, 6, 7 and 8 belong to VLAN ID 10 and ports 1, 9, 10, 11, and 12 belong to VLAN ID 15.

When an untagged packet is received on port 1, the packet is sent to ports 1, 2, 3, and 4 since the output VLAN ID on port 1 is set to 2.

When an untagged packet is received on port 2, the packet is sent to ports 5, 6, 7 and 8. In addition, before sending the packet to ports 6 and 7, the packet is tagged.

Figure 6-16 Example: 802.1Q VLAN Configuration

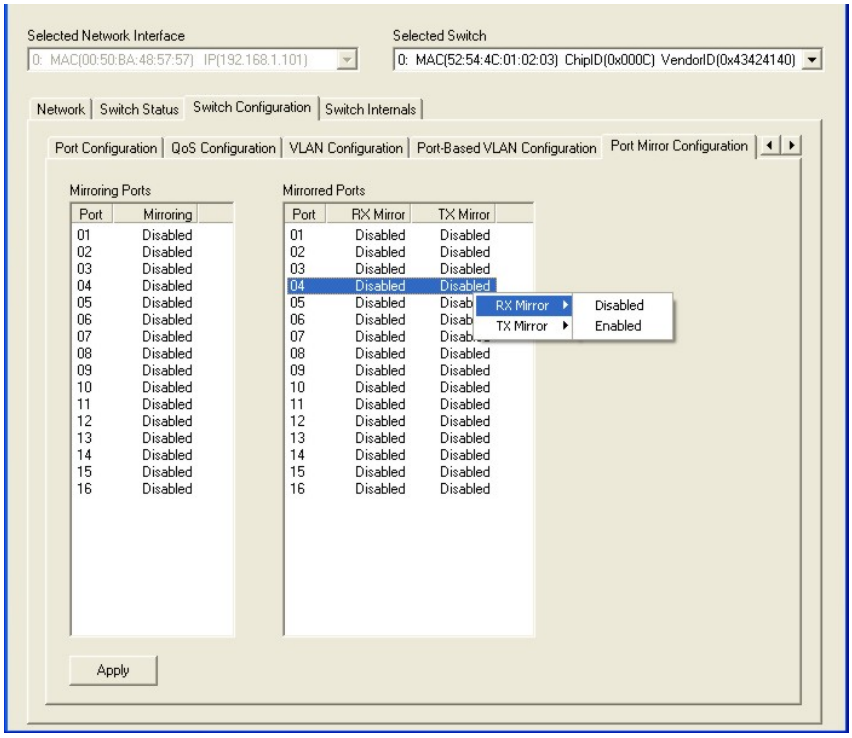


6.6. Port Mirror Configuration

With port mirroring, the switch copies the incoming and/or outgoing traffic from a port to another port. This is usually used for traffic analysis and diagnostic purposes.

Click **Switch Configuration > Port Mirror Configuration** to display the screen.

Figure 6-17 Switch Configuration: Port Mirror Configuration



The following table describes the labels in this screen.

Table 6-7 Switch Configuration: Port Mirror Configuration

LABEL	DESCRIPTION
Label	Description
Mirroring Ports	Specify which port(s) to which the switch copies the traffic from the mirrored ports. Right-click on a port and click **Enabled** or **Disabled**.
Port	This field displays the port number.
Mirroring	This field displays **Enabled** when you set this port as the mirroring port. This field displays **Disabled** when you deactivate mirroring on this port.
Mirrored Ports	Specify which port(s) and the traffic the switch copies to the mirroring port(s). Right-click on a port and click **TX** or **RX** for the outgoing or incoming traffic respectively. Then click **Enabled** or **Disabled** to copy the specified traffic.
Apply	Click **Apply** to save the changes.

6.6.1. Port Mirror and Performance

When you enable a port as a mirroring port, this may decrease the performance on that port since bandwidth must be shared with the copied traffic.

To ensure that the RMT can communicate with the switch for management, you cannot enable port mirroring on the port used for RMT management. If you do so, a warning screen

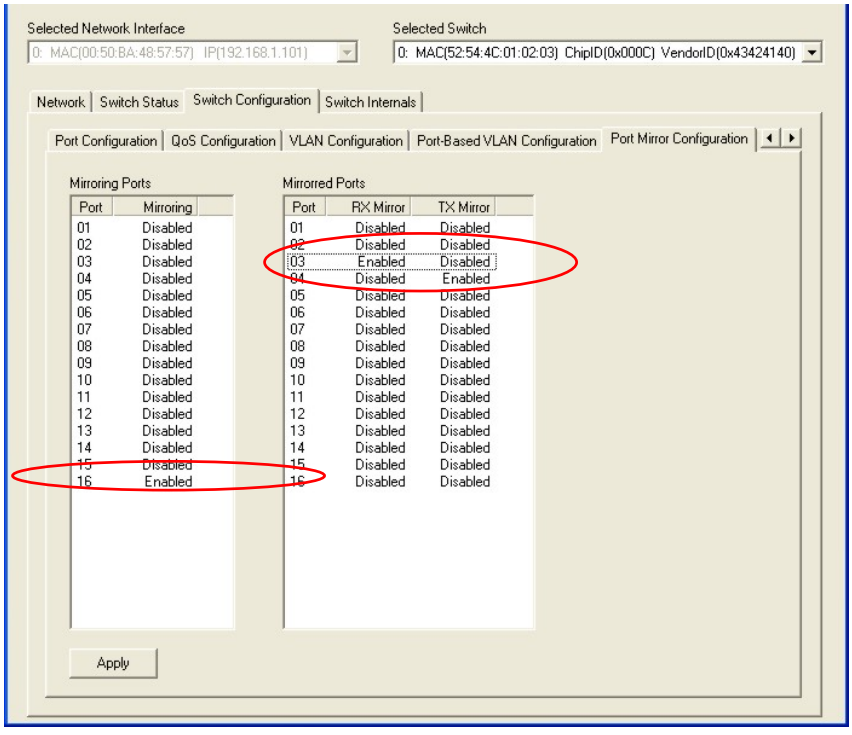
will display.

Figure 6-18 Switch Configuration: Port Mirror Configuration: Warning

6.6.2. Example: Port Mirror

In the following example, the switch copies incoming traffic from port 3 and outgoing traffic from port 4 to the mirroring port 16.

Figure 6-19 Example: Port Mirror Configuration



6.7. Security Configuration

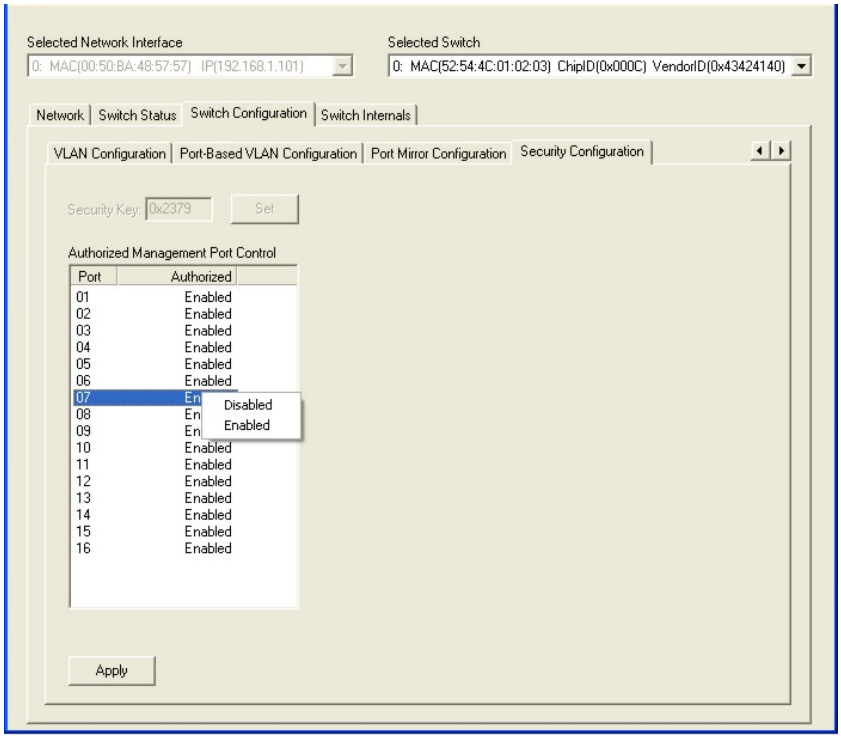
Use the **Security Configuration** screen to view the authentication key and select the ports you can use to access the switch for management with the RMT.

Click **Switch Configuration > Security Configuration** to display the screen.

To activate or deactivate management through a port, right-click on the port and click **Enabled** or **Disabled**. If you disable a port, this means that you cannot use RMT to manage the switch through that port.

Click **Apply** to save the changes.

Figure 6-20 Switch Configuration: Security Configuration



Chapter 7. Switch Internals

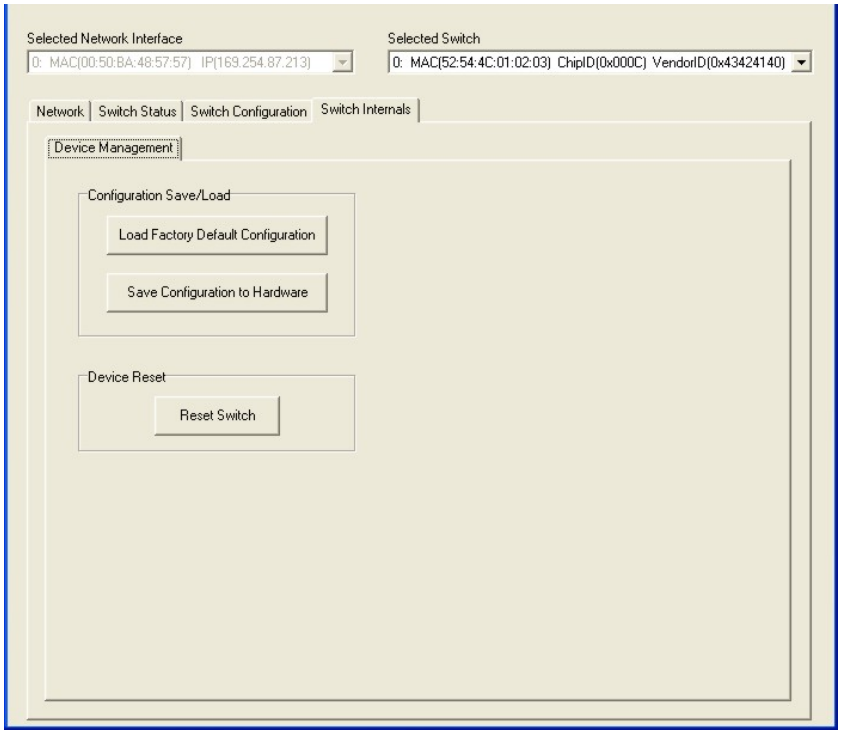
7.1. Device Management

Use the **Device Management** screen to save the configuration changes from the RMT to the switch or restore the switch's configuration back to the factory defaults.

You can also use this screen to restart the switch without turning off and on the power source.

Click **Switch Internals > Device Management** to display the screen as shown.

Figure 7-1 Switch Internals: Device Management



7.1.1. Restoring the Configuration Back to the Factory Default

To restore the switch configuration back to the factory default, click **Load Factory Default Configuration** in the **Device Management** screen.

This will erase ALL your custom settings.

7.1.2. Saving Configuration

To save the configuration changes you made in the RMT, click **Save Configuration to Switch** in the **Device Management** screen.

You should save configuration changes to the switch before exiting the RMT. All unsaved configuration changes will be lost when you close the RMT.

7.1.3. Restarting the Switch

To restart or reboot the switch, click **Reset Switch** in the **Device Management** screen.

Appendix 1. Troubleshooting

PROBLEM	CORRECTIVE ACTION
I cannot run the RMT.	Make sure you have installed the RMT successfully. Try installing the RMT on a different computer.
The RMT cannot find my switch.	Make sure the switch is powered on. Check the Ethernet cable connection on both ends. Make sure the cable length is not more than 100 meters. Check that the Ethernet cable type is correct. Check the LED for the corresponding connection port on the switch. Use a different Ethernet cable if problem persists. Power off and on the switch and try accessing the switch again.